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SUPPLEMENT,

1900,

RELATING TO THE

AFRICA PILOT, PART III.

SIXTH EDITION, 1897.

PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.

LONDON:
PRINTED FOR THE HYDROGRAPHIC OFFICE, ADMIRALTY,
By EYRE AND SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY;
AND SOLD BY
J. D. POTTER, AGENT FOR THE SALE OF ADMIRALTY
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J. D. POTTER, Agent for the Sale of Admiralty Charts.
31, Poultry, and 11, King Street, Tower Hill.

1900.

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ADVERTISEMENT.

This Supplement to the 6th Edition of Africa Pilot, Part III., 1897, contains all the information received in the Hydrographic Department of the Admiralty since the publication of the book.

Tables, showing the method of constructing a Tide Table for port Natal, which were calculated by Captain W. N. Goalen, of the Hydrographic Department, and Meteorological observations for Simons bay and port Natal, form an Appendix.

By the publication of this Supplement all Notices to Mariners, including No. 442 of 1900, are cancelled.

W. J. L. W.

Hydrographic Office,
Admiralty, London.
August, 1900.

For later information respecting the lights mentioned in this book seamen should consult the Admiralty List of Lights, Part VI.

These Lists are published annually, corrected to the previous 31st December.

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The existence of this Supplement is to be entered on the opening page of Africa Pilot, Part III. The information in it is to be carefully considered.

One of the copies is to be cut up, and inserted in the pages affected of the book. The other copy is to be retained intact for reference.

SUPPLEMENT,
1900,
RELATING TO THE
AFRICA PILOT, PART III.

SIXTH EDITION, 1897.

The several paragraphs follow the order of the paging of the Africa Pilot, Part III., 1897; the pages referred to are given herein, in the margin.

All Bearings are Magnetic. Variation in 1900.

Table bay and Cape Agulhas	29° 20′ *W.*
Cape Recife	28° 55′ *W.*
East London	28° 20′ *W.*
Port Natal	26° 30′ *W.*
Delagoa bay	*see* page 13
Mouths of Zambesi river	16° 0′ *W.*
Mozambique	12° 30′ *W.*
Cape Delgado	10° 40′ *W.*
Zanzibar	9° 40′ *W.*
Mombasa	8° 15′ *W.*
Mayotta	10° 20′ *W.*

I (8)11521. 3000.—9/1900. Wt. 112.

CHAPTER I.

CAPE COLONY.—Trade.—In 1898 the value of the imports amounted to 16,682,438*l.*, and exports to 25,318,710*l.*; the value of gold and diamonds being 15,394,442*l.* and 4,566,897*l.*, respectively; during the same year the total tonnage of the vessels, entered at the ports of the colony, amounted to 5,602,860 tons, of which 4,847,249 were British. The coal raised in 1898 amounted to 191,858 tons. p. 3.

NATAL.—Statistics.—Line 15 from top:—*Omit* ivory; *add* tea and coal. In 1899 the total exports amounted in value to 3,028,000*l.*, and imports, inclusive of Government stores and railway materials, to 6,719,000*l.* 387,811 tons of coal were raised in 1898. p. 6.

In 1899, 369 steam and 47 sailing vessels, with an aggregate tonnage of 1,763,370 tons, entered the port of Durban.

RHODESIA.—The Chartered Company's territories are now known as Rhodesia. The Zambesi is the northern limit of Southern Rhodesia, but Northern Rhodesia extends to lake Tanganyika. p. 8.

Mafeking is included in Cape Colony.

BRITISH EAST AFRICA.—Latham island, in lat. 6° 54′ S., long. 39° 56′ E., was, in 1899, annexed by the Government of Zanzibar. p. 10.

RAILWAYS.—Lines 9, 10 from top. *Read*, From Kimberley the line is now extended to Bulawayo in Rhodesia. p. 13.

Line 20 from top. *Add*, and with Pietersburg.

Lines 3–5 from top. The branch line, north-eastward from Durban, named the North Coast line, now extends to Bond's drift on the Tugela river, and the branch line from the South Coast junction, known as the South Coast line, to Park Rynie about 2 miles south of Umpambinyoni river. p. 14.

Line 9 from top. *Read*, From Beira the railway is now extended to Salisbury, and the construction of the line from the latter place to Gwelo and Bulawayo, distances of 150 and 300 miles respectively, has been commenced.

Line 17 from bottom. The railway from Mombasa is (1900) open for traffic for 362 miles out of the estimated total length of 583 miles; final sections and surveys have been completed for the whole length. The telegraph line from the Indian Ocean to Ripon Falls (north side of Victoria Nyanza lake) was completed in March 1900, but the cable does not yet touch at Mombasa, which is the sea end of the land line. Telegrams from Victoria Nyanza are, at present, sent by steamer to Zanzibar to be cabled.

LAKE NYASA.—Telegraph.—The line is now (1900) open to Abercorn, about 12 miles from the south end of lake Tanganyika, with stations at Karonga, Kota Kota and Bandawe, on the west side of lake Nyasa; it is in course of construction to Kituta, at the south end of lake Tanganyika, and is surveyed to Kasanga, about 21 miles from Kituta, and on the east side of the lake. p. 14.

MOZAMBIQUE.—Rainfall.—In 1897 the rainfall amounted to 38·9 inches, the greater part of which fell in the months of January, February, March, May, and December. p. 29.

CHAPTER II.

CAPE TOWN.—Outer harbour and docks.—The extension of the breakwater for a further distance of 1,050 feet in an E. by S. direction, has been sanctioned. There is a depth of 27 feet, at low-water, spring tides, alongside the south pier. There are electric lights on breakwater and pier.* p. 55.

Dock.—Robinson dock has a depth of 24 feet in the middle caisson landing. The largest vessel which has been docked is the S.S. *Norman*, 7,537 tons, 490 feet long, 53 feet beam, and 23½ feet draught. p. 56.

Patent slip.—The patent slip is 184 feet in length on the cradle.

Tug.—A new and powerful twin-screw tug takes vessels in and out of harbour. This tug is also fitted as a fire-float, and has electric search lights. p. 58.

Coal.—About 12,000 tons of coal are kept in stock; the coal wharves are 600 and 400 feet in length, with depths of 28 and 22 feet respectively at low water, spring tides. Strong N.W. and S.E. winds prevent, or impede, coaling. Four new steel barges, of from 100 to 300 tons capacity, facilitate coaling operations from the off-sides of steamers.

Trade.—In 1899 the value of the exports amounted to 14,782,350*l*., and imports to 4,795,290*l*. In 1898 the aggregate tonnage of vessels which entered the port was 3,191,013 tons, of which 2,760,270 were British vessels.

Current.—It is reported that during heavy weather, the current, in the harbour and within the dock area, is so strong that vessels have found difficulty in lying alongside some of the wharves. p. 59.

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* *See* Admiralty chart:—Table bay breakwater and docks, No. 123; scale, *m* = 24·5 inches.

ROMAN ROCKS.—LIGHT.—*See* Additions and alterations to lights, p. 35. p. 73.

Rambler rock, a rocky patch, with a depth of 27 feet over it, is situated with Roman rocks lighthouse bearing N. 31° W., distant $2\frac{3}{10}$ cables, and Noah's Ark S. 77° W.

SIMONS BAY.—Patent slips.—There are four patent slips, the dimensions being as follows*:— p. 74.

No. 1.—Length on cradle 176 feet; breadth, cradle, 48½ feet; depth forward, 10 feet.

No. 2.—Length on cradle, 78 feet; breadth, cradle, 21 feet; depth forward, 7 feet.

No. 3.—Length on cradle, 107 feet; breadth, cradle, 22 feet; depth forward, 7½ feet.

No. 4.—Length on cradle, 74 feet; breadth, cradle, 19 feet; depth forward, 4½ feet.

No. 1 slip has taken H.M.S. *Swallow*, 1,130 tons; 195 feet by 28 feet; mean draught, 11 feet 6 inches.

Inner anchorage.—The inner anchorage is an area which has for its boundaries seaward a line drawn N. 20° E. from Whittle Upper beacon, meeting a line drawn S. 70° E. from the centre of the present railway station, and this enclosed space is under the control of the Senior Naval Officer, whose sanction is necessary before merchant vessels can berth in it. p. 75.

No ballast, ashes, &c. are allowed to be thrown overboard in this area; nor are merchant vessels allowed to have gunpowder, other explosives, or combustible substances on board without permission, and, if necessary, steam vessels may be required to reduce the speed to 4 knots per hour when within the prescribed limits.

Should a merchant vessel foul any of the Government moorings, electric cables, &c., notice is to be given to the Senior Naval Officer, without any attempt being made to clear the same.

Trade.—In 1899 the exports amounted in value to 13,544*l.*, and imports to 4,803*l.*; the aggregate tonnage of vessels entered amounting to 11,146 tons in 1898.

POINT DANGER.—LIGHT.—*See* Additions and alterations to lights, p. 35.† p. 81.

Signal Station.—There is a signal station at point Danger.

See chart, No. 123.

* *See* Admiralty chart:—Simons bay, No. 1,849; scale, *m* = 12·0 inches.

† *See* Admiralty chart:—Cape Hangklip to Dyer island, No. 2,571; scale, *m* = 1·0 inch.

CHAPTER III.

p. 86. **CAPE AGULHAS.—LIGHT.**—*See* Additions and alterations to lights, p. 35.

p. 95. **CAPE ST. BLAIZE.**—**Signal station.**—There is a signal station at Cape St. Blaize.*

p. 97. **MOSSEL BAY.—Trade.**—In 1899 the exports amounted in value to 312,392*l.* and imports to 254,910*l*

ALIWAL HARBOUR LIGHT.—*See* Additions and alterations to lights, p. 35.

Beacon.—A beacon, surmounted by a diamond, with black and white horizontal battens, has been erected on the hill, south of the town of Aliwal, the beacon in line with the Port office flagstaff, near the wharf, bearing S.S.W., indicates the best line for anchoring, in depths of from 4 to 6 fathoms for steam, and a depth 7 fathoms for sailing, vessels.

p. 103. **KNYSNA RIVER.—Jetties.**—The town jetty has only 2 feet water alongside it. Parden island jetty is wooden, weak, and only suitable for small vessels; there are three mooring buoys off this jetty, and a bridge crosses the river about half a mile above Belvidere.†

Supplies.—Mutton and oysters can be obtained in large quantities; fresh beef is scarce, and water can only be procured in small quantities.

Communication.—A mail cart communicates with Cape Town three times a week; there is also telegraphic communication.

Trade.—In 1899 the exports amounted in value to 7,524*l.* and imports to 9,810*l.*

Beacon.—A beacon, composed of white stones, stands on the south-west shore of Best cove.

Depth on bar.—The depth on the inner bar of Knysna river has decreased to 13 feet.

With a southerly wind and an ebb tide, the bars break heavily even in calm weather.

p. 104. **Beacons.**—It is reported that the beacons, when in line, bearing N.E. ¾ N., lead too close to the western shore of the entrance.

p. 105. **Directions.**—Lines 3, 4 from bottom. The stakes, which marked the spit extending southward from Parden island, have disappeared.

p. 114. **CAPE ST. FRANCIS.—Signal station.**—A Lloyd's signal station has been established at Cape St. Francis.‡

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* *See* Admiralty chart:—Mossel bay, No. 639; scale, $m = 2 \cdot 2$ inches.

† *See* Admiralty chart:—Knysna harbour, No. 1,224; scale, $m = 4 \cdot 0$ inches.

‡ *See* Admiralty chart:—Cape St. Francis to Waterloo bay, No. 2,085; scale, $m = 0 \cdot 30$ inch.

CHAPTER IV.

p. 120. **CAPE RECIFE.—Signal station.**—A Lloyd's signal station has been established at Cape Recife.*

p. 120. **PORT ELIZABETH.—LIGHTS.**—*See* Additions and alterations to lights, p. 35.†

p. 122. **Trade.**—In 1899 the exports amounted in value to 2,458,508*l.*, and imports to 5,565,570*l.*; in 1898 the aggregate tonnage of vessels which entered the port was 598,888; British vessels being 364,197 tons.

Coal.—In fine weather about 300 tons of coal can be put on board, during a working day, and about 500 tons by working day and night; S.E. winds occasionally impede coaling.

There are two coaling wharves each about 900 feet in length and having 23 and 18 feet alongside respectively. The coal lighters hold from 30 to 130 tons.

p. 123. **Anchorage.**—The anchorage, southward of a W. ½ S. bearing of the North jetty lighthouse, is reserved for vessels of the regular mail steamship lines; vessels of war anchor north of this line, and merchant vessels still further north.

Tides.—It is high water, full and change at Port Elizabeth at 3h. 20m.; springs rise 5¾ feet, neaps 4 feet, neaps range 2¼ feet.

p. 127. **Port Instructions.**—10. When the red ball or danger signal is hoisted on the flagstaff at the end on the jetties, any person or persons attempting to land at, or embark from, the jetties shall be liable to a penalty not exceeding a fine of twenty pounds (20*l.*), or in default of payment to imprisonment.

When the red ball or danger signal is hoisted, no boats will be allowed to leave the jetties, excepting in cases of emergency, and then only with the special permission of the harbour master or his deputy.

p. 130. **BIRD ISLAND.—LIGHT.**—*See* Additions and alterations to lights, p. 35.‡

p. 131. **Tides.**—It is high water, full and change, at Bird islands at 4h. 0m.; springs rise from 4 to 5 feet.

p. 137. **PORT ALFRED.—KOWIE RIVER LIGHT.**§—*Discontinued.*

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* *See* Admiralty chart: Algoa bay, No. 642; scale, *m* = 1·0 inch.

† *See* Admiralty chart: Port Elizabeth, No. 641; scale, *m* = 4·0 inches.

‡ *See* chart, No. 642.

§ *See* Admiralty chart:—Kowie river entrance (Port Alfred), No. 1,223; scale, *m* = 6·0 inches.

p. 141. **GREAT FISH POINT.—LIGHT.**—*See* Additions and alterations to lights, p. 35.*

p. 147. **HOOD POINT LIGHT.**—*See* Additions and alterations to lights, p. 35.*

p. 148. **BUFFALO RIVER.—LIGHTS.**—*See* Additions and alterations to lights, p. 35.

p. 151. **Bar.**—In 1898 the depths on the bar of the river were, as a result of dredging operations, considerably increased, as much as 20 feet at low water, ordinary springs being sometimes obtained. As, however, the bar still varies, no fixed minimum depth can at present be stated, though shoals that form are removed as soon as possible. In February 1899 the S.S. *German*, drawing 16 feet 8 inches, and in October 1899 the S.S. *Crown of Arragon*, drawing 19 feet 9 inches, crossed the bar, the latter under unfavourable circumstances, the former vessel being 440 feet in length, 53 feet beam, 6,763 tons, and the latter 300 feet in length, 37 feet beam, and 2,293 tons.

In February 1900, H.M.S. *Barrosa* found 21 feet at low water, spring tides on the shoalest part of the bar, but vessels of not more than 20 feet draught could go alongside the wharves.

p. 152. **Directions.**—Lines 1–3 from top, *substitute*: A white mark on the base of the lighthouse in line with a white mark on the end of the harbour works office, bearing N. 81° W., leads over the bar in the best water.

The wind gauge has fallen down and in its place there is a flagstaff surmounted by a white triangle, apex down.

EAST LONDON.—Wharves.—The present wharfage accommodation is 2,285 feet, with three jetties, each 50 feet long, for timber ships, but a concrete wharf, with a depth of 28 feet at low water, is under construction.

Trade.—In 1899 the exports amounted in value to 1,038,148*l.*, and imports to 2,986,831*l.*; during the year 1898 the aggregate tonnage of vessels which entered the port, was 1,714,240; of this 1,651,665 were British.

Coal.—The quantity of coal kept in stock varies between 2,000 and 500 tons, but never less than the latter amount. There are a number of tugs and lighters.

Repairs.—There are cranes with the following lifting powers:—2 lifting 15 tons; 2 lifting 7 tons (steam travelling); 10 lifting from 2½ to 10 tons, and one, which will lift 50 tons, will shortly be added.

Hospital.—There is a hospital and a sailors' home.

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* *See* Admiralty chart:—Buffalo river, No. 1,843; scale, *m* = 5·95 inches.

Time signal.—The frame is to be shifted to a position about one cable, S.W. by S. of the present one, so that the ball can be seen by vessels lying at the wharves. p. 153.

Patent slip.—The patent slip is 200 feet in length on the cradle, with a depth of 10 feet aft at high water, ordinary springs, and will take a vessel of 1,000 tons.

CHAPTER V.

MAZEPPA BAY.—Signal Station.—It is reported that this signal station is not in existence. p. 160.

BASHEE RIVER.—Beacon.—The beacon is a tripod, the three legs being of tarred beams; it is reported to be very indistinct, and not visible from a distance of probably more than 6 miles. p. 163.

CAPE HERMES.—Signal station.—A Lloyds signal station has been established at cape Hermes.* p. 165.

ALIWAL SHOAL.—LIGHTS.—*See* Additions and alterations to lights, p. 35.† p. 171.

Lines 3–7 from bottom, *substitute*: Vessels wishing to pass inside the Aliwal shoal, should, if coming from the southward, keep the light on Amahlongwana just changing from *white* to *red* on a bearing of N. 19° E. until Umpambinyoni light begins to turn from *red* to *white* on a S. 82° W. bearing, when, by keeping it on that bearing until Amahlongwana *white* light again shows out on a N. 32° W. bearing they will have passed a mile inside the shoal.

If coming from the northward the Umpambinyoni light should be kept just changing from *white* to *red*, on a bearing of S. 82° W., until Amahlongwana light begins to change from *red* to *white* on a N. 19° E. bearing, on which it should be kept astern until the *white* sector of Umpambinyoni light opens on a N. 62° W. bearing.

Vessels, wishing to pass outside Aliwal shoal, should, if coming from the southward, steer so as to sight the *red* sector of Amahlongwana light and should not lose sight of the *white* sector of Umpambinyoni light until the *white* sector of Amahlongwana light opens out on a bearing of N. 32° W.

If from the northward, vessels should steer so as to sight the *red* sector of Umpambinyoni light and should not lose sight of the *white* sector of Amahlongwana light until the *white* sector of Umpambinyoni light opens out on a N. 62° W. bearing.

See chart, No. 1,843.

* *See* Admiralty chart:—Saint John or Umzimvubu river, No. 2,566; scale m = 6·0 inches.

† *See* Admiralty chart:—Umtamvuna river to Tugela river, with plan of Aliwal, shoal, No. 2,088; scale m = 0·28 inches.

CAPE NATAL.—Lines 1–3 from top. The two white leading marks are no longer of use, as the north pier extends through their line.* p. 173.

PORT NATAL.—LIGHTS.—*See* Additions and alterations to lights, p. 35.

The Port.—Line 9 from top. The extension of the north pier, in course of construction, will reduce the width of entrance, between it and the south breakwater, to 200 yards. p. 175.

Line 17 from top. *For* filled with mud, *read* filled with sand.

For lines 20–23 from top, *read*: the part available for a harbour is confined to a channel about 1½ cables in breadth and a mile in length, with depths varying from 15 to 22 feet. This is also being improved by dredging.

For lines 24–28 from top, *read*: **The bar,** which originally had as little as 8 feet over it at low water, has been so greatly improved by dredging that vessels drawing 23 feet have recently (1900) entered at high water. It appears to be still subject to sudden change, both in direction and depth, after bad weather, but the banks formed on these occasions are removed by dredgers with as little delay as possible. Owing to its liability to change, the bar should never be attempted by a stranger, and moreover no stranger would be acquainted with the position of the vessels inside the harbour. The working channel runs in a W.S.W. direction, and is known as the south channel.

Black conical buoys mark the entrance channel, and are shifted as necessary.

Line 9 from bottom. *For* 19 feet draught entered in January 1895, *read* —In 1898 a steamer of 21½ feet, and a sailing vessel of 22 feet 1 inch draught entered the port, and in 1899 a steamer of 22½ feet and sailing vessel of 23 feet 5 inches draught. The S.S. *Winifredian*, single screw, 575 feet long and 10,400 tons, is the largest vessel that has entered the port to May 1900.

The following table showing depths on the bar for the years 1895–1899, both inclusive, mark the great improvement which has taken place.

Year.	Average Depth at Low Water.	Average Greatest Depth.	Month.	Average Least Depth.	Month.	Bar dangerous.	Bar impassable.
	Ft. Ins.	Ft. Ins.		Ft. Ins.		Days.	Days.
1895	12 1	15 0¾	Jan.	10 0¾	Aug.	45	21
1896	16 0	18 5	May	10 9½	Jan.	29¾	19¾
1897	17 3	20 2	Nov.	14 0	March	32⅔	18½
1898	18 7	20 7	Sept.	15 8¾	July	30¾	19½
1899	19 7½	—	—	—	—	—	—

NOTE.—In the month of July, 1898, following a week of stormy weather, the bar silted up and not more than 15 feet could be obtained at high water for a few days.

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* *See* Admiralty chart:—Port Natal entrance, No. 2,908; scale, *m* = 12·0 inches.

Line 2 from top. *For* 17 feet draught, *read* 19 feet draught. p. 176.
Lines 6–8 from top. *Delete.*

Directions.—*For* paragraph, as at present, *substitute:* On arriving in the road, in bad weather, it will be advisable to signal for instructions before anchoring.

Berthing.—Lines 1–5 from top.—Vessels lie alongside the wharves in low water depths of from 13 to 23 feet, and railway wagons are run alongside the wharves.* All vessels, removed from the wharves, make fast to Government moorings, of which there are several sets. p. 177.

DURBAN.—The houses are now principally built of brick. There are three Episcopalian churches. The population in 1896 was about 34,000, of whom 15,000 were Europeans. A tramway runs to the Berea. p. 178.

Repairs.—Steam sheers lift 20 tons, and there are 21 hydraulic cranes, lifting from 1½ to 3 tons, with depths of from 18 to 23 feet alongside at low water. There is a steam hammer of 5 tons. The principal engineering works are close to the wharf, and at Umgeni, distant 6 miles from Durban, and connected by railway.

Patent Slip.—The extreme length of the patent slip is 485 feet, length on cradle 180 feet, and the lifting power 1,000 tons. The draught of water raised, with 5½ feet rise of tide, is as follows:—200 feet long, 9 feet; 184 feet long, 10 feet; 168 feet long, 11¼ feet and 140 feet long 12½ feet.

Dock. *Proposed.*

Coal.—Coal lighters take from 30 to 150 tons. About 400 tons of coal may be taken on board working during the day, and about 600 tons by working day and night. Easterly or westerly gales, mostly in April and September, impede coaling.

By giving notice, by telegraph, lighters would be laden with coal ready in bags.

In October 1898 H.M.S. *Magicienne* coaled alongside the wharf, and left the harbour drawing 20 feet 2 inches.

Signal Staff.—Signals, to or from the outer anchorage, are made through Bluff signal station, where there is also a semaphore.

Tugs.—There are two powerful steam tugs.

Tides.—*See* Appendix, page 39.

UMLATUZ RIVER.—Coal.—Coal exists at Mtambanana, and is being bored for near the mouth of the Umlatuz river.† p. 184.

See chart, No. 2,908.

* It is proposed to provide a quay wall with a depth of 27 feet, at low water, alongside it.

† *See* Admiralty chart:—Tugela river to Delagoa bay, No. 2,089; scale, *m* = 0·17 inch.

BLACK BLUFF.—Shoal.—S.S. *Umfali*, 1898, touched either bottom, or something submerged, in lat. 28° 44½′ S., long. 32° 12¾′ E. This reported danger has been placed on the charts as a rock, with less than 6 feet water on it, in the above position, which is about 1½ miles southward of Black bluff. p. 184.

ST. LUCIA BAY.—Sugarloaf hill, although still conspicuous, is overgrown with bush and scrub: the square-topped sand hill, similarly overgrown, is not easily recognised.* p. 185.

LEADSMAN SHOAL.—Line 12, from top. *For* 6 miles southward from Leven point, *read* 6 miles northward from Leven point. p. 187.

COAST.—Line 15 from top. *For* 14 miles, *read* 4 miles. p. 188.

Kosi river.—Fairly good anchorage, in about 8 fathoms water, may be obtained off the entrance in calm weather, but it should not be brought to bear north of West. Landing is generally impracticable, and with on-shore winds and in heavy weather, breakers extend about 1½ cables from the beach.†

Landmarks.—About 2 miles northward of Steamer rock, the hill (240 feet high) has two sandy roads on its seaward slope; when coming from the southward, and till abreast the hill, these roads, which cross diagonally, form a conspicuous mark.

INYACK ISLAND.—Beacon.—A triangular beacon, 39 feet high, and painted white, has been erected on the north point of Inyack island; it is situated with Inyack lighthouse bearing about S. 17° E., distant 6 cables, and cape Inyack S. 63° E.‡ p. 189.

The beacon, in line with Inyack lighthouse, leads through the Cockburn channel.§

CAPE INYACK LIGHT.—*See* Additions and alterations to lights, page 35.

Signal Station.—There is a signal station on Inyack island, which is connected by wire with the Port Captain's office.

Danae shoal is said to break at times with smooth water and a heavy swell.

See chart, No. 2,089.

* Landing at St. Lucia bay was effected with great difficulty, the breakers extending 200 yards off shore; and in many places in the bay the surf extends a quarter of a mile off the coast, and is exceptionally heavy, even in fine weather.—Commander C. H. Dundas, R.N., H.M.S. *Forte*, May, 1900.

† *See* plan of Kosi river anchorage on chart, No. 2,089.

‡ *See* Admiralty Chart:—Delagoa bay, No. 644; scale, *m* = 1·0 inch.

§ This mark is said to lead too close to a depth of 3½ fathoms on the eastern extension of Cockburn shoal, consequently vessels, using the channel, keep Inyack lighthouse slightly open eastward of the beacon, bearing about S. 15° E.

COCKBURN SHOAL.—*Lighthouse building.*—A lighthouse is p. 190.
in course of construction on Cockburn Shoal; the position is approximately lat. 25° 53′ 20″ S., long 32° 54′ 10″ E. The pile driving apparatus used in constructing, is established about one cable South of Cockburn shoal buoy, and exhibits a *fixed white* light, which should not be mistaken for a similar light, but indifferent, which is shown from the pilot hulk.

DELAGOA BAY. — Magnetic disturbance. — Recent observations point to a considerable local magnetic disturbance in different parts of Delagoa bay, the variation, at Lorenzo Marques and in English river, for the year 1900, being 23° 15′ W., while at Timpson point, Shefina island, it is 20° 55′ W., and at Gibbon point, Elephant island, about 20° only.

Observations, by swinging at sea off this place, also point to the probability of the variation, off this part of the coast, being less than given on the Variation chart by about 1½°, but sufficient data has not yet been received to enable the chart to be corrected.

Cockburn Shoal Buoy.—The buoy is pyramidal shaped, painted black, surmounted by staff and ball, and moored in 11 fathoms water, with Black Bluff bearing S. 12° W. and Inyack island lighthouse S. 22° E.

HOPE SHOALS.—Buoy.—A buoy, painted red and surmounted by a triangle, is moored in 5½ fathoms at low water, with Cape Inyack lighthouse bearing S. 2° E., distant $8\frac{1}{10}$ miles, and Gibbon point, S. 35° W.

The position of this buoy should not be depended on.

FAWN SHOAL.—Buoy.—Fawn shoal is marked, on its east p. 192.
side, by a conical buoy, painted red, and surmounted by a staff and cone of the same colour; it is moored in 9 fathoms water, with Elephant point beacon bearing S. 6° E., distant $5\frac{4}{10}$ miles; Shefina beacon N. 83° W.

LECH REEF.—Buoy.—The buoy is a barrel-buoy, painted red, and moored in 7½ fathoms water, on the southern edge of Lech reef, with Elephant point beacon bearing S. 34° E., distant 6 miles, and Shefina beacon, N. 77° W., but the positions of this or Fawn shoal buoy should not be depended on.

SHEFINA ISLAND.—LIGHT.—*Proposed.*—*See* Additions p. 193.
and alterations to lights, page 35.

REUBEN POINT LIGHT.—*See* Additions and alterations to lights, page 37.

Beacon.—The beacon on Reuben point is triangular-shaped, 59 feet high, the top, surmounted by a triangle apex down, being 141 feet above the sea; it is painted in alternate black and white bands, and from it Reuben

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See chart, No. 644.

point lighthouse bears S. 80° E., distant 722 feet. Seen from a distance seaward, this beacon is stated to have the appearance of a grey church spire. p. 193.

Beacon.—Gibbon point beacon reported (1898) to have fallen down, is stated to be replaced, but S. 25° E. distant 2 cables from its former position. In 1900 large baulks of timber, bound together, and just awash were lying, in 4 fathoms of water, about 1¼ cables westward of the new beacon; this is probably material for constructing Cockburn shoal lighthouse, which was washed away.*

Line 17 from bottom. *For* (on which is a house), *read* (on which is a barrack with a red roof).

Cutfield hummock is said to be not easily distinguished when coming from the northward; the streak of sand on the easternmost summit of the high land is its most noticeable feature.

Tides.—It is high water, full and change, at Shefina island at 4 h. 40 m.; springs rise 12 feet.† p. 194.

Pilot hulk.—A hulk, painted black, lettered *Pilotos* on sides, and having three pole masts, is moored with Inyack lighthouse bearing S. 20° E., distant 7½ miles and Black bluff S. 14° W., this position, however, should not be relied on; pilots can be obtained from, and discharged to, the hulk. The hulk exhibits a *fixed white* light. *See* also Cockburn shoal lighthouse, page 14.

Approximate position of hulk, lat. 25° 53′ 0″ S., long. 32° 54′ 5″ E.

Pilots cruise off Hope shoals; they have letter P, in white on a black ground, on mainsail as well as flag.

Line 11 from top. *Expunge* pilot station.

Directions.—The following route to English river is recommended:‡ p. 195. After rounding Cockburn shoal buoy, steer S. 80° W. until Reuben point lighthouse bears N. 76° W., distant 9 miles, when alter course for it, and the beacon on Reuben point will appear open to the southward of the lighthouse. When inner Catembe beacon bears N. 88° W. steer for it until Reuben point is abeam or Lechmere point bears N 40° W.; this N. 88° W course, with the inner Catembe beacon open a quarter of a point southward of the outer, leads over the bar in the best channel.§

Line 18 (from top) to line 22 should be expunged.

Foot note. *Expunge.*

See chart, No. 644.

* *See* Admiralty chart:—Port Melville, No. 645; scale, $m = 2 \cdot 25$.

† *See* chart, No. 644.

‡ Navigating Officer, H.M.S. *Forte*, April 1900.

§ It is reported that positions, fixed by cross bearings of objects on Inyack island, do not agree with positions, fixed at the same time, by cross bearings of objects situated on the mainland.

p. 196. **ENGLISH RIVER.—LIGHTS.**—*See* Additions and alterations to lights, page 37.*

p. 197. **Beacon.**—A triangular shaped beacon, 42 feet above high-water and painted white has been erected in a position with Catembe light beacon bearing S. 89° W., distant 984 feet; the beacon stands in front of a small white house, the roof of which is painted red and white in stripes.†

Buoys.—A conical red buoy, surmounted by a staff and cone, is moored in 3 fathoms water off Reuben point, with Reuben point lighthouse bearing N. 11° W. distant about 6 cables.

A black can buoy, surmounted by a staff and cylinder, is moored in 2½ fathoms water, on the edge of Catembe shoal with Reuben point light bearing N. 48° E. distant one mile, and Catembe light N. 87° W.

Anchorage.—It is stated that vessels of war are not permitted to anchor north-west of a north and south line (true) through the flagstaff at the office of the Captain of the Port. It is advisable to anchor as close up as this line will permit, in view of obtaining smoother water than would be found nearer the entrance of the harbour.

Merchant vessels berth above the Portuguese Guard Ship, and it is compulsory that they should moor.

Lechmere point.—A large blue house stands almost at the extreme of Lechmere point; this is useful to mark the point which is otherwise frequently obscured by shipping.

p. 198. **LORENZO MARQUES.**—The streets are lighted by electric light.

Population.—In 1899 there were 5,130 inhabitants, of which 1,500 was the estimated number of natives.

Trade.—In 1898 the value of the imports amounted to 751,931*l.*, and exports to 16,800*l.*

Shipping.—In 1898, 452 steam and 70 sailing vessels entered the port.

p. 199. **Harbour works.**—Soundings are being taken and surveys made for proposed harbour works; these will embrace a large extent of the left bank of the river.

Pier.—An iron passenger pier, with Customs baggage room, was completed in 1898.

Coal.—About 1,500 tons of Welsh coal are kept in stock, the price being about 65*s.* per ton; there are 10 lighters, and about 200 tons could

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* *See* Admiralty chart:—English river, bar, and harbour, No. 646; scale, *m* = 1·9 inches.

† The positions of these beacons are doubtful.

be put on board during a working day, or 350 tons by working day and p. 199.
night.

In 1898 the importation of coal from the Transvaal was on the increase; 14,660 tons having been brought down by rail during that year against 7,900 tons in 1897. This coal, which is said to be of as good quality as any mined in Natal, can be put in the bunkers at 23*s.* per ton.

Tugs.—Tugs are available.

Patent Slip.—The patent slip at Catembe, which now takes a vessel of 6 feet draught, is to be lengthened, and will then take a vessel drawing 7½ feet water.

Repairs.—Small repairs to machinery can be executed at the Government workshops at Catembe, or the shops of the Delagoa Bay Ironworks.

There are eight cranes of from 2 to 6 tons on the Customs wharf, and six steam cranes, each capable of lifting 12 tons, at the Netherlands Railway pier.

Communication.—Mails.—The weekly mail service viâ Cape Town and Johannesburg is excellent, letters usually arriving on the twenty-first day after leaving England.

There is frequent communication, by small steamers, with Marracuene, p. 200.
Limpopo, and Bella Vista for Maputuland.

Climate.—From May to September the climate is delightful, with bright sunny days, the thermometer very rarely going above 80° or below 60° Fahr.; this period, however, contrasts very unfavourably with the other half of the year.

CATEMBE RIVER.—This river is navigable for small vessels p. 201.
drawing 6 feet water for a distance of 60 miles; for the last 25 miles of this distance the depths are regularly 1½ fathoms, and the water is said to be drinkable.

MAPUTA RIVER.—The Maputa river is known as Unsuti by the natives.

KING GEORGE RIVER.—The native name of this river is p. 202.
Incomati.*

ELEPHANT ISLAND.—There are two houses, with red roofs, p. 203.
near the beach on the west side of Elephant island; the northern and larger of the two, forms a convenient anchoring mark. Gibbon point is said to have changed its position and shape, and extended to the westward.†

See chart, No. 646.

* *See* Admiralty chart:—Delagoa bay to river Zambesi, No. 648; scale, $m = 0\cdot1$ inch.

† *See* chart, No. 645.

Buoy.—A buoy, painted red, is moored about 3 cables westward of the south point of Elephant island, with Black Bluff bearing S. 2° E., distant 15 cables. p. 203.

Directions.—As a shoal, with from 2¼ to 3 fathoms water over it, extends for three-quarters of a mile to the northward of Gibbon point and on the line of the leading mark (S. 3° E.) at present given, vessels, approaching port Melville, should open the white barrack with red roof well to the westward of Gibbon point bearing about S. by E. until Gibbon point bears S.E., then steer to pass 1½ cables from it, and when the white barrack bears S. ½ E., steer for it and anchor in about 10 fathoms water, over sand, with the larger house on Elephant island bearing East. p. 204.

The shoals in the vicinity of Elephant island are said to have shifted and caution is necessary.

COAST.—It is stated that neither Salmon cliff, nor the orange-coloured sand hill are conspicuous.

LIMPOPO RIVER.—In addition to the name Innampura river, the Limpopo is also known to the natives as the Krokodil, the Oori, the Lebepe, the Lebempe, or the do Ouoro. Its source is said to be in the Cats Rand mountains in lat. 26° 20′ S., long. 28° 45′ E., and it flows through gold-bearing land.* p. 205.

Depths.—From information received (1900) it would appear that the depth on the bar is only 2 feet, but it is probably subject to great changes, and the passage should not be attempted without examination.

Lines 4–6 from bottom. These beacons are not in existence. In 1899 a single beacon, consisting of a mast surmounted by a triangle, painted white, and having on it a black disc stood on the right bank near the sea. This is probably shifted according as the bar varies.

Tides.—It is high water, full and change, in the Limpopo river at 4 h. 20 m.; springs rise 11 feet.

ZAVORA RIVER.—**Shoals.**—Heavy breakers were seen from H.M S. *Forte*, on two occasions, when passing this locality.† p. 206.

CHAPTER VI.

INNAMBÁN RIVER.—**Outer anchorage.**—Vessels lying at anchor under the lee of Barrow hill should guard against N.E. and East winds.‡ p. 210.

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* *See* Admiralty plan :—Limpopo river ; scale, $m = 6 \cdot 28$ inches ; on chart, No. 685.

† *See* chart No. 648.

‡ *See* Admiralty plan :—Innambán river; scale, m 1·65 inches ; on chart, No. 650.

The bar.—In 1899 the bar of the river was reported to have shifted considerably to the southward. p. 211.

Buoyage.—In 1899 there was no buoy on or near the bar.

A cylindrical buoy, painted black, was moored with Linga Linga point bearing N. 53° E., distant 9 cables.

A cylindrical buoy, painted red, with Linga Linga point bearing N. 1° W., distant $1\frac{2}{10}$ miles.

A mooring buoy, painted black, with Linga Linga point bearing N. 3° E. distant $1\frac{4}{10}$ miles.

Beacons.—The following beacons were standing in 1899, but were not easily distinguished:—

North beacon, painted white, on the shore about $1\frac{1}{2}$ miles, N. 30° E., from Pedestal; this is used for crossing the bar.

Two wooden framework beacons, A* and B, 26 feet in height, and painted black, one surmounted by a triangle, the other by a disc painted black, situated on the mud-flat north-north-east of Makukoni point; the beacons are a mile apart and in line bearing S. 43° W. From A, the northern beacon, Makukoni point bears S. 31° W., distant $2\frac{3}{4}$ miles.

A framework beacon, C, painted white, on the mud flat N. 53° W., distant $1\frac{4}{10}$ miles from Makukoni point, and a beacon with a white disc and black centre near the position marked "white house" on chart. These beacons are in line bearing S. 51° W.

There are also two beacons on Banguei point.

Directions.—On account of the shifting nature of the bar, and the consequent alterations from time to time in beacons and buoys, it is not advisable to enter without previous examination if local knowledge is unattainable.

In 1899 the depth on the bar at low water was 18 feet, and the leading mark, for crossing, the north beacon in line with two trees on the shoulder of the hill marked American Mission, bearing W. by N.† When Pedestal comes in line with a tree near Double bush, having a disc painted white with a black centre, and bearing S. 75° W. it should be steered for until the beacons A and B come in one, bearing S. 43° W.; this mark leads to the northern buoy, which should be left on the port hand.

See chart, No. 650.

* Reported blown down, January 1900. No reliance should be placed on finding these beacons in position.

† It is reported (1900) that a tree, having on it a disc painted white with a black centre, and situated near Mungo point, now forms with the beacon, the leading mark over the bar, when in line bearing N. 77° W., but the position of this rear mark is not given. The ground in the vicinity has been cleared of trees to allow this mark to be more easily recognised.

The red buoy is left on the starboard, and black buoy on the port hand passing close to the latter; then bring the beacon C and the small beacon with black and white disc in line, bearing S. 51° W., and continue thus (leaving beacon C about 2 cables on the starboard hand) till the beacons on Banguei point are in line, which leads towards the anchorage off the fort. p. 211.

BAZARUTO ISLAND.—LIGHTS.—*See* Additions and alterations to lights, p. 37.* p. 215.

PUNGUE RIVER.—Shoal in the approach.—A depth of 7 fathoms, over fine grey sand, has been reported (1899) about 10 miles S.E. by S. from the fairway buoy, or approximately in lat. 20° 2′ S., long. 35° 7′ E.† p. 221.

Depths.—The shoal on the north side of the channel, north-east of No. 1 buoy, is reported to be extending to the southward.‡

The deepest draught vessel, belonging to the British India Navigation Co., which entered the port of Beira in 1898 was S.S. *Patna*, drawing 19 feet. By Pilotage Certificates received (1900) H.M.S. *Thetis* drawing 19 feet 4 inches, went into Beira harbour, in charge of a pilot, on 23rd February 1900, and H.M.S. *Magicienne*, drawing 20 feet, entered in October 1899.

CAUTION.—The depths in the channels and the position of the shoals vary, therefore local knowledge is necessary before attempting to enter, and caution must be observed in using the Admiralty plan.

LIGHTS.—*See* Additions and alterations to lights, p. 37.

Buoys.—Channels.—Shoals.—In February 1900, No. 5 buoy was found to be situated with the south extreme of Massique point bearing N. 29° W., distant 2¼ miles, and point Jea tower N. 45° E.

At this time here were, after passing No. 6 buoy, two navigable channels to the anchorage, the western of the two, passing close to Massique point and the land to the northward, being the deeper and more intricate. The eastern channel, which lies between Nos. 5 and 7 buoys, was, however, the one generally used. In it the depth is about 20 feet at high water.

In May 1900 a black buoy, surmounted by a staff and globe, was moored about 2½ miles N. 88° W. of the fairway or outer buoy, to mark the

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See chart, No. 650.

* *See* Admiralty chart:—Bazaruto bay, No. 685; scale, $m = 0 \cdot 37$ inch.

† *See* Admiralty chart:—Delagoa bay to river Zambesi, No. 648; scale, $m = 0 \cdot 1$ inch. The conspicuous tree, marked on this chart, about 13 miles north-east of the entrance to the river Pungue, stands out dark and clear, and somewhat resembles a large vessel under sail; it is useful in making the entrance, but must not be mistaken for another tree further to the eastward.

‡ *See* Admiralty plan:—River Pungue, No. 1,003; scale, $m = 1 \cdot 0$ inch.

southern edge of the 17 feet shoal. Approximate position lat. 19° 56′ 35″, long. 34° 56′ 35″ E. p. 221.

A shoal, with a depth of 13 feet over it, is reported to exist at a distance of about 6 cables, S. 74° W., from the above buoy, and with point Jea bearing N. 22° W., distant $7\frac{1}{10}$ miles.

Buoyage—From the 1st June 1900, the buoyage will be changed to a uniform system as follows :—

Buoys, on the starboard side of the channel in entering, will be coloured red, and numbered, from seaward, Nos. 2, 6, 8.

Buoys, on the port side of the channel in entering, will be coloured black, and numbered 1, 3, 4, 5, 7, and 9.

The colour only, not the shape or topmark, is the distinctive characteristic showing on which side the buoy should be passed.

Pilots.—A pilot service is established, and pilots may be obtained in moderate weather; the pilot vessel is painted black, has **Pilotos** in conspicuous letters on each side and the letter **P.** on the mainsail. A blue flag, with letter **P.** in white on it, is hoisted at the mainmast.

BEIRA.—Population.—In 1899 the population of Beira was 4,130, of which 444 were British subjects. p. 223.

Harbour works.—The sea wall has been continued to a total distance of 1,140 yards along the sea front.

Works are in progress to reclaim a portion of Chiveve creek; it is intended to construct a quay about 220 yards in length, and to dredge a channel 110 yards in width, with a depth of 29½ feet, sufficient to allow large vessels to enter the creek and lie alongside the quay; the reclamation and embankment are nearly completed.

Anchorages.—The anchorage for vessels of war is in the space between the Chiveve tower, bearing S. 70° E., and the post office on the same bearing: merchant vessels anchor north of this latter line and in the space between it and the Railway pier on the same bearing. Vessels carrying explosives anchor in a triangular space enclosed by the following:—S.E. point of Utanhe island N. 5° E.; Chiveve tower, N. 84° E., and point Jea tower, S. 48° E.

Repairs.—There are cranes at the Railway pier which will lift 15 tons.

Trade.—The exports from Beira, in 1899, amounted in value to 28,495*l.*, and the imports to 547,633*l.*; in the same year 236 steam, and 10 sailing, vessels entered the port with an aggregate tonnage of 351,754 and 2,690 tons respectively. p. 224.

See chart, No. 1,008.

Railway.—The railway is completed from Beira to Salisbury; and commenced to Buluwayo. p. 224.

Tides.—It is high water, full and change, at the entrance of the Pungue river at 4 h. 22 m. p. 225.

Line 14 from top, *for* Naves *read* Neves. p. 226.

ZAMBESI RIVER.—In February 1899 there was a heavy flood in the Zambesi, the river rising higher than has been known for many years (height not stated). p. 228.

CHINDE RIVER.—Depth.—Captain P. Tillard, R.N., H.M.S. *Magicienne,* 1898, remarks, "There was 12 feet water on the bar at high "water on 14th August when I crossed in S.S. *Matabele.*" On 3rd March, 1899, the bar was sounded by the Navigating Officers of H.M. ships *Fox* and *Sparrow*, and a depth of 16 feet obtained at high water. p. 233.

LIGHTS.—*See* Additions and alterations to lights, p. 37.

In March 1900, the lighthouse on Mitaone point, in line with the beacon behind, led over the bar, and it is stated that the marks will be moved to meet changes.

Buoys.—In March 1900, the fairway buoy, moored in 4 fathoms water, was painted black and white in stripes, and the entrance channel was marked by one red buoy on the starboard side and two black buoys on the port side. p. 234.

CHINDE.—Population.—In 1898 the population was 1,675, of which number 34 were British subjects.* p. 236.

Trade.—In 1898 the value of imports amounted to 63,212*l.* and exports to 91,760*l.*; during the same year 65 steam, and 34 sailing, vessels entered the port, with aggregate tonnages respectively of 54,059 and 2,118.

Patent Slip.—A patent slip was in course of construction (1898) abreast the dockyard in British concession, but abnormally high tides on 9th, 10th, and 11th April, 1898, washed away 28 feet of the foreshore rendering about three-quarters of the slip absolutely useless, owing to the railway irons being bent and twisted. p. 237.

Telegraph.—Chinde is connected by telegraph with Cape Town *viâ* Salisbury; the line to the northward *viâ* Blantyre is now extended to lake Tanganyika.

See chart, No. 1,003.

* *See* Admiralty chart:—River Chinde, No. 1,421; scales, 1· and 2·00 inches.

Zambesi and Shiré river steamers.—In 1899 the following vessels belonging to the African Lakes Corporation were on the Zambesi and Lower Shiré*:— p. 239.

The *Scott*, the *John Stephen*, the *Sir H. Johnston*, the *Princess*, and the *Bruce;* these are all stern wheelers, with barges, and are from 35 to 80 tons, draw from 20 to 30 inches of water when partially loaded, and have speeds of from 9 to 10½ knots an hour.

Two steamers, the *Empress* and the *Duchess*, were shipped from the Clyde in October 1899.

LAKE NYASA.—Line 4 from bottom.—*For* Nyanyja, *read* Nyanja. p. 259.

The height of lake Nyasa is now given as 1,700 feet above sea level.†

Tanganyika lake is 2,680 feet above sea level. p. 263.

Steamers on lakes Nyasa and Tanganyika and Upper Shiré river.—In 1900 the following steamers were on the above lakes and the Upper Shiré river:— p. 264.

The Administration gunboats *Guendolen* and *Pioneer:* the former, 350 tons displacement, 136 feet in length, and with 25 feet beam, is a twin screw vessel and the largest steamer on lake Nyasa.

The *Domira*, 50 tons, with a speed of 9 knots, and the *Queen Victoria*, 100 tons, 6 feet draught, and a speed of 10 knots; these are both single screw vessels.

The *Adventure* and *Ilala*, both belonging to the African Trans-Continental Telegraph Co.

The *H. von Wissmann*, belonging to the German Government, and the Universities Mission ship, *Charles Jansen;* another missionary ship for lake Nyasa was shipped from the Clyde in October 1899.

In addition to the *Good News*, on lake Tanganyika, the *Cecil Rhodes*, building in England, is a vessel of 45 tons.

A steel schooner has lately been built on lake Tanganyika.

On the Upper Shiré river are the *Monteith* and *Livingston*, both of 50 tons, the former a stern wheel, with 18 inches draught and a speed of 9 knots, and the latter a twin screw vessel drawing 32 inches and steaming 10 knots an hour. A new stern wheel steamer, named the *Stairs*, has lately been added, and a paddle steamer, named the *John Bowri*, is building.

KILIMAN RIVER.—Beacons.—The outer beacon on Tangalane point is not easily distinguished.‡ p. 274.

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* *See* Admiralty chart:—Sketch of Lower Zambesi and Shiré rivers, No. 1,577; scale, *m* = 0·16 inch.

† *See* Admiralty chart:—Lake Nyasa, southern portion, No. 1,578; scale, *m* = 0·15 inch.

‡ *See* Admiralty plan: Kilimán river, No. 650; scale, *m* = 1·65 inch.

Two additional beacons have been erected on the western side of the river, close to the red tiled house (marked on chart); they lead through Militao channel, but, on account of the bush, are not so discernible as those on the eastern bank. Approximate position of red-tiled house, lat. 18° 0′ 35″ S., long. 36° 53′ 45″ E. p. 284.

In 1898 the buoys in Militao channel had disappeared.

KILIMÁN.—Trade.—In 1899 the imports amounted in value to 117,935*l.* and exports to 65,051*l.*; during the same year 82 steam and 62 sailing vessels entered the port with aggregate tonnages of 71,801 and 4,999 tons respectively. p. 276.

Communication.—The small coasting steamers of the Aberdeen line visit the port every fortnight. p. 277.

CHAPTER VII.

MACUSE RIVER.—It is stated that the Macuse river is navigable by vessels drawing 12 feet water for a distance of 25 miles. There is a channel from this river communicating with Kilimán river.* p. 280.

Tides.—It is high water, full and change, in Macuse river at 4 h. 20 m.

MAZEMBA RIVER.—The bar is said to be so shallow at neap tides that it can be crossed wading; it appears probable that it is at times unsafe for boats.

MONIGA (TEJUNGO) or KISUNGU RIVER.—In 1898 there was reported to be a depth of 14 feet at low water, spring tides, on the bar of this river. On the south-west point of entrance there was a clump of trees and two isolated tall trees with a sand hill a little to the southward of them, and the mark used for crossing the bar, which lies about 2 miles seaward of the entrance points, was this sand hill bearing N. 39° W. At low water, spring tides, the sea usually breaks on the bar. p. 281.

ANGOCHE (Mluli) RIVER.—It is reported that not less than 25 feet water will be found on the bar, and that a pilot may be obtained.† p. 286.

ANTONIO RIVER.—Tides.—It is high-water, full and change, in Antonio river, at 3 h. 15 m; springs rise 13 feet, neaps 10 feet. p. 289.

Water.—Fresh water, of good quality, may be procured from springs near the river.

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* *See* Admiralty chart: River Zambesi to Mozambique harbour, No. 1,810; scale, $m = 0{\cdot}1$ inch.

† *See* plan of Angoche port and bar on chart No. 1,810.

MUITÉ RIVER.—Infussé bar.—This bar is stated to be exceedingly dangerous on account of the heavy breakers; boats have been capsized and lost on it. p. 291.

PORT MOKAMBO.—The shoals at the entrance of Namarimella river are reported to be extending to the westward. p. 292.

MOZAMBIQUE HARBOUR LIGHTS.—*See* Additions and alterations to lights, p. 37.* p. 295.

Signal station.—A Lloyds signal station has been established at Fort St. Sebastian, north-east end of Mozambique island. p. 296.

Buoys.—The red buoy, marking Sebastian spit, is the only one now maintained at Mozambique harbour; the remaining buoys, marking Leven bank, Harp Shell spit, and the shoals extending from St. George's and St. Iago islands, have been withdrawn.

Wreck.—In 1899 a wreck, with mast showing at high-water, was lying N. ½ W., distant 1$\frac{4}{10}$ miles from St. George island lighthouse.

Directions.—North Channel.—Give the north-east point of St. George island a berth of half-a-mile on the flood, as it sets strongly towards it. p. 297.

Line 8 from top.—*For* the broad white stripe on Fort St. Sebastian, *read* a triangular beacon, showing white parallel lines.

Line 10 from top.—*Omit* buoy.

Lines 10–13.—Cabeceira Grande house in line with the Harp shell spit beacon, bearing N. by W., leads within 100 yards of St. Sebastian spit buoy.

Bottom line.—*Substitute* triangular shaped beacon showing white parallel line *for* white stripe on Fort St. Sebastian.

Population.—In 1898 the population consisted of 262 Europeans, 789 Asiatics or mixed European and Asiatic or Africans, and about 7,000 African natives. p. 298.

Mails.—The British India Company's vessels call irregularly; the Deutsche Ost Africa steamers every fortnight. p. 299

Hospital.—The Government hospital is a large building containing 300 beds.

Coal.—About 3,000 tons of coal are usually kept in stock, the price being about 60*s*. per ton. The lighters hold from 10 to 30 tons. Coaling may be impeded for a few days in the year by strong north or south winds.

Trade.—In 1899 the exports were valued at 20,820*l*., and imports 102,698*l*.

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* *See* Admiralty chart:—Mozambique harbour, No. 652: scale *m* = 1·8 inch.

PORT VELHACO.—The sea has been observed to break very heavily near Velhaco point. Anchorage on the bar is dangerous.* p. 303.

KISIMA-JULU.—The reef, which fringes the shore between Kisima-Julu and cape Melamo, is said to extend fully 1½ miles off shore †

NAHARENI POINT.—Line 8 from top. A two story house, with a red roof and a flagstaff near it, stands on Nahareni point. p. 304.

ALMEIDA BAY.—**Tides.**—It is high-water, full and change, in Almeida bay at 4 h. 10 m. (approximate) ; springs rise from 12 to 15 feet.‡ p. 307.

IBO HARBOUR.—**Buoys.**—The black buoy, on the southern edge of Corea de S. Gonsalo, has been replaced by a spherical buoy, painted red and white in horizontal bands.§ p. 313.

Approximate position, lat. 12° 17′ S., long. 40° 37¼′ E.

The two red buoys, on the northern side of Mujaca shoal, have been replaced by two black cylindrical buoys placed on the two projecting points of the reef.

A black spherical buoy, placed inside the harbour, marks the southern limits of the anchorage.

These buoys are moored in 4 fathoms at low-water, and may be passed at a convenient distance, but vessels should not go to the southward of the buoy marking the anchorage.

The black buoy marking the east end of Corea de S. Gonsalo, and the mooring buoy in the anchorage, have been removed.

KERO NYUNI PASS.—**Tides.**—Neaps rise 8 feet.‖ p. 319.

CHAPTER VIII.

KEONGA BAY.—**Buoyage.**—The two inner buoys are spar buoys.¶ p. 334.

Tides.—It is high-water, full and change, in Keongo bay at 4 h. 10 m. ; springs rise 12 feet.

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* *See* Admiralty chart :—Mozambique harbour to Ras Pekawi, No. 1,809 ; scale, *m* = 0·18 inch.

† *See* plan of Fernando Veloso bay on chart No. 1,809.

‡ *See* plan of Almeida bay on chart No. 1,809.

§ *See* plan of Ibo harbour, on chart No. 1,809.

‖ *See* Admiralty chart :—Ras Pekawi to cape Delgado, No. 658 ; scale *m* = 0·35 inch.

¶ *See* Admiralty chart :—Cape Delgado to Mikindani bay, No. 690 ; scale *m* = 1·0 inch.

MIKINDANI HARBOUR.—Tides.—It is high-water, full and change, in Mikindani harbour at 3 h. 45 m.* p. 342.

Mikindani is said to be the most unhealthy port of German East Africa. p. 343

LINDI RIVER.—Beacons.—Two beacons, as leading marks over the bar of the river, have been erected northward of Lindi.† p 347.

The front beacon is a white obelisk, 16 feet in height, and situated on the shore line.

Approximate position, lat. 9° 59′ 10″ S., long. 39° 43′ 25″ E.

The rear beacon, about 30 feet high, is a pole surmounted by a triangle, point upwards, situated S. 70° W., distant 2 cables from the front beacon.

These two beacons in line, bearing S 70° W., lead over the bar after passing buoy A.

The red spar buoy, marked B, has disappeared and will not be replaced and the position of the other buoys must not be depended on.

KILWA RIVER.—Directions.—Line 8 from bottom.—The observation spot baobab tree is now marked with a white streak, about 9 feet long, and should be more easily identified.‡ p. 356.

FANJOVE ISLAND.—LIGHT.—*See* Additions and alterations to lights, p. 37.§ p. 361.

CHOCHA REEF.—Buoy.—The red spar buoy, marked II. Mafia, moored at the south-east point of Chocha reef, has disappeared and will not be replaced. p 365.

MOHORO BAY.—Buoy.—A small buoy has been moored in Mohoro bay, but its position is not given. p. 366.

SIMBA URANGA.—Buoy.—The red can fairway buoy, moored about 4½ miles northward of the high trees at Simba Uranga entrance, will be replaced by a red and black conical buoy, surmounted by a black cross.‖ p. 369.

RUFIJI DELTA.—Simba Uranga mouth.—A custom house stands on the western side of this entrance; it is approximately in lat. 7° 45′ 48″ S., long. 39° 21′ 36″ E.¶ p. 371.

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[*] *See* Admiralty chart:—Mto Mtwara and Mikindani harbour, No. 684; scale *m* = various.

[†] *See* Admiralty chart:—Lindi river, No. 681; scale *m* = 3·0 inches.

[‡] *See* Admiralty chart:—Kilwa Kisiwani harbour, No. 661; scale *m* = 2·0 inches.

[§] *See* Admiralty chart:—Channels between Ras Tikwiri and Mafia island, No. 1,032; scale *m* = 0·5 inch.

[‖] *See* Admiralty chart:—Mafia island and channels, No. 458; scale, *m* = 0·5 inch.

[¶] *See* Admiralty chart:—Kilwa point to Zanzibar channel, No. 662; scale, *m* = 0·17 inch.

CHOLE BAY.—Buoys.—Three small buoys have been established in this bay, but their positions are not given.* p. 374.

MAFIA CHANNEL.—Buoyage.—The buoys, marking the fairway of Mafia channels, are all on the Mafia island side; they are conical black buoys numbered 1 to 7. p. 375.

A new buoy (No. 2) is moored on the western edge of Shungu Mbili reef, consequently the numbers of the buoys have been altered, the former No. 2 becoming No. 3, and so on. Approximate position No. 2 buoy, lat. 7° 41′ 50″ S., long. 39° 40′ 0″ E.

Funga Marima.—The red spar buoy, marked C. Mafia, marking the south point of the reef, has been withdrawn.

Omit first two lines except the word Kisimani. p. 377.

RAS MKUMBI LIGHT.—*See* Additions and alterations to lights, p. 37. p. 378.

Shoal.—Ras Mkumbi should not be passed at a distance of less than 1½ miles, as a shoal, with a depth of 13 feet over it, is reported to exist at a distance of one mile north-east of the lighthouse.

The following buoys are withdrawn:— p. 380.

Wumi reef.—The red spar buoy, marked B. Mafia, moored eastward of the reef.

Fili reef.—The red spar buoy, marked A. Mafia, moored to the northward of the reef.

RAS KANZI LIGHT.—*See* Additions and alterations to lights, p. 37. p. 385.

CHAPTER IX.

DAR-ES-SALAAM HARBOUR.—Landmarks.—Top line. Owing to landslips, the white tombs have almost entirely disappeared, but the new hospital, a large two storied building, which may be seen from a distance of 16 miles, when bearing S. 44° W., leads between the reefs. p. 395.

Line 3 from top. *Add* Ras Makahe may be distinguished by a pavilion and a baobab tree. p. 397.

Beacons and Buoys.—The white pyramid beacon and the obelisk on Ras Rongoni are in line bearing S. 6° W.†

The position of the red spar buoy, with white topmark B, which lies south-east of North sand head, is not to be depended on.

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* *See* chart, No. 458.

† *See* Admiralty chart:—Dar-es-Salaam and adjoining anchorages, No. 674; scale, m = 1·5 and 6·0 inches.

p. 397. **Directions.**—Line 10 from bottom. *For* in line bearing S. $\frac{3}{4}$ W., *read* in line bearing S. 6° W.

Line 4 from bottom. The red spar buoy C is said not to be in line with the tower of the Protestant mission when on this course.

Line 3 from bottom. The conical beacon on the south shore is stated to be in front of the white wall, and that course should not be altered until the beacon is in line with the east end of the wall. (Top line.) p. 398.

Tides.—Neap tides rise 9 feet.

Population.—In 1899 the population was about 15,000, including from 300 to 400 Europeans.

Hospitals.—There are two hospitals, one for Europeans at Ras Chokir, the other, for Askaris, in the Kaiser Strasse. The European hospital has accommodation for 30 patients, and there is also a small-pox station.

p. 399. **Communication.**—Overhead telephone wires connect all the principal stations, and the town of Dar-es-Salaam is provided with a complete telephonic installation. Several hundred miles of wire have been laid towards Tabora.

There are good roads to Tabora and Bagamoya; to reach the former takes about 35 days, and Government houses, provided with necessaries, are located at distances of daily stages.

Dock.—A steel floating dock, constructing at Kiel, is expected to be sent out during the present year (1900). The dimensions are: Length over all, 212 feet; length on blocks, 205 feet; breadth inside, 55$\frac{2}{3}$ feet; depth on blocks at high-water, ordinary spring tides, 19$\frac{2}{3}$ feet; and it will have a lifting power of 1,800 tons. It is constructed so that it may be enlarged if necessary.

Coal.—There is a coal shed capable of holding about 4,000 tons, but all coal in store belongs to the Government.

Water is obtained entirely from wells.

p. 418. **PANGANI RIVER.—Buoyage.**—The red and black striped can buoy, surmounted by a cross, moored on the north side of the entrance, will be replaced by a red and black striped conical buoy, marked Pangani, and surmounted by the letter **P.**

Approximate position, lat. 5° 26′ 30″ S., long. 39° 0′ 15″ E.*

p. 421 **ZANZIBAR ISLAND.—Trade.**—The total value of exports amounted in 1898 to 1,497,883*l.*, and imports to 1,555,070*l.*; in the same year 175 steam and 8 sailing vessels entered the port with aggregate tonnages respectively of 280, 887, and 5,322 tons.

See chart No. 674.

* *See* Admiralty chart:—Pangani to Ras Kimbiji, No. 640 b; scale, *m* = 0·5 inch.

CHUMBE ISLAND.—*Lighthouse constructing.*—*See* Additions and alterations to lights, p. 37.* p. 429.

Line 4 from bottom. *For* hidden by trees, *read* partly hidden by trees. p. 432.

Mooring buoys.—There are mooring buoys in the northern anchorage for the steamers of the lines that visit the port. p. 433.

Telegraph buoys.—The telegraph buoys are spherical, painted green, and have the word *Cable* marked on them in white letters.

ZANZIBAR TOWN.—LIGHTS.—*See* Additions and alterato lights, p. 37.

Line 6 from top. A tower has been erected on the Sultan's palace. p. 434.
The clock tower which stood westward of the palace has been demolished.

Coal.—The lighters hold from 10 to 80 tons. p. 436.

Tugs are available.

Mungopani.—The white pillar and square brown house, with flat roof, at Mungopani village are said not to exist. p. 438.

LIGHTS.—*See* Additions and alterations to lights, p. 37. p. 444.
Line 16 from top. *Delete* white pillar.

CHAPTER X.

CHAKI CHAKI BAY.—Ras Tundauwa.—A flagstaff has been erected on the east side of Ras Tundauwa, in approximately lat. 5° 15′ 20″ S., long. 39° 41′ 20″ E.† p. 456

Shoals.—Line 6 from bottom. *For* about one mile, *read* $1\frac{2}{10}$ miles.

A patch of $2\frac{1}{4}$ fathoms lies with Ras Tundauwa flagstaff bearing S. 16° W., distant $5\frac{1}{2}$ cables, and Ras Banani white chimney, S. 86° E.; and another patch, with the same depth over it, is situated with Ras Tundauwa flagstaff bearing S. 44° W., distant $6\frac{1}{4}$ cables, and Ras Banani chimney, S. 87° E.

Mesale Island.—A flagstaff has been erected on the west side of Mesale island, in approximately lat. 5° 14′ 25″ S., long. 39° 35′ 55″ E. p. 457.

Buoys.—Shoals in the approach to the anchorage of Chaki Chaki bay are marked by buoys as follows:—

A conical buoy, painted red, is moored at the extremity of the spit extending from Ras Tundauwa, from which it is distant half a mile,

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[*] *See* Admiralty charts:—Zanzibar harbour and its approaches, No. 665; scale $m = 1 \cdot 5$ inches.

[†] *See* Admiralty chart:—West coast of Pemba island, No. 1,812; scale, $m = 1 \cdot 5$ inches.

p. 457. N. by W. ½ W. The north-east side of an isolated patch is marked by an oblong buoy painted red, it lies N.W. ½ N., distant three-quarters of a mile from Ras Tundauwa.

The north extreme of the shoal, extending westward from Fungu Sisimizi, is marked by a conical-shaped buoy, painted black and red, moored N. by W. ¼ W., distant $1\frac{1}{10}$ miles from Ras Tundauwa.

p. 458. **Anchorages.**—Line 7 from top. The large castellated house is said to be not easily distinguished.

Supplies.—At Ras Tundauwa anchorage, supplies, chiefly consisting of fruit and vegetables, may be obtained from a farm.

p. 463. **WETI HARBOUR.—Buoys.**—Two shoals on the south side of the entrance are marked, on their northern sides, by buoys, painted red. The outer bears N. 89° W., distant 1½ miles, and the inner N. 71° W., distant one mile from Ras Tungwi.

p. 465. **MSUKA BAY.—RAS KEGOMACHA.**—*Lighthouse building.**

Beacon.—A triangular-shaped beacon, painted white, has been placed on a whitewashed tree about a mile westward of Taponi; it is 52 feet above high water, and when bearing S. 4° W., leads in to the anchorage.

p. 469. **MCHENGANGAZI.—Tides.**—It is high water, full and change, Mchengangazi passage at 3 h. 43 m.; springs rise 11 feet, neaps 7¾ feet, neaps range 5¾ feet.†

p. 475. **TANGA BAY.—Mooring buoy.**—A red mooring buoy will be established, but its position it not stated.‡

p. 477. The Deutsche Ost Afrika Company have two iron lighters which will take from 50 to 60 tons.

p. 482. **VANGA CREEK.**—Boats entering should leave the island at the entrance on the port hand.§

p. 489. **MOMBASA GAP.**—The gap is said not to be seen open until it is bearing southward of West.‖

p. 491. **MOMBASA.**—*Light intended. See* Additions and alterations to lights, p. 37.

Beacons.—*Add.* The flagstaff, at the Mission station at Kisauni, has been replaced by a white stone pillar 35 feet high.

See chart, No. 1,812.

* *See* Admiralty chart:—Chale point to Pangani, No. 1,390; scale, *m* = 0·5 inch.

† *See* plan of Mchengangazi on chart, No. 1,310.

‡ *See* Admiralty chart:—Mansa and Tanga bays, No. 663; scale, *m* = 1·92 inches.

§ *See* chart No. 1,390.

‖ *See* Admiralty chart:—Port Mombasa, No. 666; scale, *m* = 6·0 inch.

Directions.—Top line. *For* flagstaff, *read* white stone beacon. *Expunge* footnote. p. 492.

Buoy.—A wooden buoy surmounted by a staff and diamond, and moored in 4 fathoms water, marks the edge of the reef extending east of the town, and two mooring buoys are moored, 2 and 3 cables respectively, north of this.

Tides.—Springs rise 12 feet, neaps rise 8 feet.

Railway.—The railway is open for traffic for a distance of 362 miles from Mombasa (1900). p. 494.

KILINDINI.—Line 20 from top, *for* Mtongwa *read* Mtongwe. p. 496.

Beacons.—Buchanan rock is marked by a tripod beacon, painted black, and surmounted by a white barrel, and Kilindini reefs are marked by a similar beacon.

Line 13 from bottom. The stone pillar is no longer there. p. 497.

Lines 10, 11 from bottom. The buoys are removed.

Line 9 from bottom. The cable ship has been removed.

Line 6 from bottom The residence of the Administrator of Mombasa is situated on the east side of the island between Ras Serani and Ras Mitani; the flagstaff has been removed from the former residence.

Footnote.—This is a square beacon of stone, about 22 feet high, and whitewashed; it is about 53 feet above high water and 65 yards from the outer beacon.

Rabai range.—Kambe, a hill which presents a clearly defined dome-shaped summit, is said to be very conspicuous.* p. 498.

TAKAUNGU.—The district officer's house, situated south-east of the fort, being whitewashed, can be seen from a distance when the river opens.† p. 499.

CHAPTER XI.

OZI RIVER.—Tides.—It is high water, full and change, at Ozi anchorage at 4 h. 8 m.; springs rise 10¾ feet, neaps rise 6½ feet.‡ p. 512.

COAST.—Aspect.—The conspicuous hill, 174 feet high, has a sharp shoulder on its northern side.§ p. 513.

See chart, No. 666.

* *See* Admiralty chart:—Zanzibar to Malindi, No. 664; scale, $m = 0\cdot17$ inch.

† *See* Admiralty chart:—Kilifi river and approaches, No. 238; scale, $m = 3\cdot0$ and $6\cdot0$ inches.

‡ *See* plan of Ozi anchorage on chart No. 1,747.

§ *See* Admiralty chart:—Malindi to Juba, No. 848; scale, $m = 0\cdot17$ inch.

BIRIKAU RIVER.—Directions.—Lines 3–6 from bottom. It is stated that a better mark is to keep the beacon in line with the northern side of the dip in the Shimowongo range, lying immediately northward of Mount Gibbon, bearing about N. 62° W.* p. 528.

Thenina island.—The wooded bluff could not be distinguished from H.M.S. *Barrosa*, 1897.† p. 531.

KISMAYU BAY.—Beacon.—Mark hill is said to be most difficult to recognise, and the column could not be distinguished from H.M.S. *Barracouta*, 1898.‡ p. 534

Fawn pass.—Lines 8–10 from top. Care is necessary in using the leading mark for Fawn pass, as the Residency, also a white building, comes in line nearly on the same bearing as the fort, and may be mistaken for it; the fort is to the westward of the Residency. p. 535.

Line 6 from bottom. Two square white watch towers about 40 feet high, and situated westward of the fort, when in line, bearing about North, form a good anchoring mark.

Landing.—The best landing place during the S.W. monsoon is on the sandy point north of Kismayu island, but during that period landing is said to be dangerous at high water. p. 537.

In the N.E. monsoon landing may be effected at any part of the beach.

RAS ASIR.—Tides.—Neaps rise 4½ feet. p. 558.

CHAPTER XII.

EUROPA ISLAND.—Water.—There is no water on the island; fishermen, who live there, distil from sea water.§ p. 560.

JUAN DE NOVA ISLAND.—Anchorage.—In taking up an anchorage coral patches should be avoided.|| p. 562.

Landing.—Turtle fishers live on the island from July to February, and during that period it is advisable to use their boats for landing.

Water.—Near the centre of the island there are two wells from which fairly good water may be obtained, but the supply is not abundant.

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* *See* Admiralty chart:—Birikau river (port Durnford), No. 425; scale, m = 2·0 inches.

† *See* chart, No. 848.

‡ *See* Admiralty chart:—Kismayu bay, No. 860; scale, m = 2·0 inches.

§ *See* Admiralty chart:—Bassas da India and Europa island, No. 851; scale, m = 0·2 inch.

|| *See* Admiralty chart:—Comoro islands, No 2,762; scale, m = 0·06 inch.

SHINDINI ANCHORAGE.—Tides.—Springs rise 11 feet.* p. 568.

MARONI TOWN.—The Residency is removed to this place.† p. 569.

MAYOTTA ISLAND.—A pilot station has been established at the south-east side of Mayotta island.‡ p. 584.

Bandéli island has a quarry or cutting on its east side which forms a very conspicuous mark. p. 588.

ZAUDZI.—MAMUTZU.—Jetties.—The jetties at Zaudzi and Mamutzu were destroyed by a cyclone in 1898. pp. 589, 590.

LIGHTS.—*See* Additions and alterations to lights, p. 37. p. 590.

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* *See* plan of Shindini on chart, No. 2,066.

† *See* plan of Maroni anchorage on chart No. 2,762.

‡ *See* Admiralty chart:—Mayotta island, No. 2,741 ; scale, $m = 0 \cdot 7$ inch.

Page of S.D.	No. in Light List.	Name of Light.	Position.	Latitude. S.	Longitude. E.	Number and Colour of Lights. Fog Signal.		Character of Light.	Period of Revolution or of System.	Miles seen in Clear Weather.
				° ′	° ′					
73	8	ROMAN ROCKS -	- -	- -	- -	–	- -	- -	- -	- -
81	9	**POINT DANGER.**	- -	- -	- -	–	- -	- -	- -	- -
86	10	**CAPE AGULHAS.**	- -	- -	- -	–	- -	- -	- -	- -
97	12	ALIWAL HARBOUR	- -	- -	- -	–	- -	- -	- -	- -
120	16	PORT ELIZABETH	- -	- -	- -	–	- -	- -	- -	- -
120	18	- -	- -	- -	- -	–	- -	- -	- -	- -
130	19	**BIRD ISLAND.**	- -	- -	- -	–	- -	Gp. Fl.	Thirty seconds.	- -
141	21	**GREAT FISH POINT.**	Summit of a sand hill, half a mile northward of the point.	33 31	27 6	1	White -	Fl.	Ten seconds.	20
147	22	**HOOD POINT**	- -	- -	- -	–	- -	- -	- -	- -
148	23	EAST LONDON -	- -	- -	- -	–	- -	- -	- -	- -
	24	EAST LONDON -	North side of entrance.	33 1	27 55	1	Green -	F.	- -	4
171	28	AMAHLONGWANA	- -	- -	- -	–	- -	- -	- -	- -
173	29	**NATAL BLUFF.**	On bluff, south of entrance.	- -	- -	–	- -	- -	- -	- -
189	35	**CAPE INYACK.**	- -	- -	- -	–	- -	- -	- -	- -
190	39	COCKBURN SHOAL	N. 23° E., 4$\frac{1}{10}$ miles from Gibbon point.	25 53	32 54	–	- -	- -	- -	- -
196	38	SHEFINA ISLAND	- -	25 53	32 42	–	- -	- -	- -	- -

No. in Light List.	General Description of Building or Vessel.	Height in Feet above High Water.	Approximate Height in Feet of Building.	Year established or altered.	Character of Apparatus, or Order, and Power in Units of 1,000 Candles, when known.	REMARKS.
8	Cylindrical, iron -	- -	45			
9	- - -	- -	60			
10	- - -	- -	63			
12	Small wooden house.					
16	Octagonal - -	- -	27			
18	- - -	- -	- -	- -	- - -	To the south-eastward the junction of the *green* and *white* sectors leads seaward of the foul rocky ground known as Strutt reef, and of the shoal of the shield of the old breakwater. To the northward the junction of the sectors warns of a too near approach to the sea-wall so that alteration in the colour of the light, from *green* to *white* on either side of the jetty indicates that the line of safety has been passed.
19	Square stone tower.	- -	85	- -	- -	Shows approximately, flash *three seconds*; eclipse, *three seconds*; flash, *three seconds*; eclipse, *twenty-one seconds*.
21	Octagonal tower, black and white stripes.	278	30	1898	D. 1st. Ord., 145.	Shows *flash half second*, eclipse, *nine and a half seconds*.
22	- - -	- -	32	- -	- - -	The flashes being ½ second; eclipses between them 4½ seconds. Eclipse between each group 25½ seconds.
23	Pyramidal	- -	37			
24	White, iron column.	64	37	- -	- - -	Visible between the bearings of N.E. by E. and W. ¾ N.
28	- - -	170				
29	Iron, conical -					
35	Black - -					
39	- - -	- -	- -	- -	- - -	*Constructing.*
38	- - -	- -	- -	- -	- - -	*Proposed.*

Page of S.D.	No. in Light List.	Name of Light.	Position.	Latitude. S.	Longitude. E.	Number and Colour of Lights. Fog Signal.		Character of Light.	Period of Revolution or of System.	Miles seen in Clear Weather.
				° ′	° ′					
193	36	Reuben (Vermelha) point.	-	-	-	-	-	-	-	17
196	37	Catembe	-	-	-	-	-	-	-	-
215	41	Bazaruto Bay	Marsha island	-	-	1	Red	F.	-	3
	42		Bazaruto island, north end.	-	-	-	-	-	-	-
221	45	Point Jea	-	-	-	-	-	-	-	-
233	47	Chinde River	Mitaone point. Front	-	-	-	-	-	-	-
			Rear	-	-	-	-	-	-	-
296	52	Mozambique Harbour.	Cabeceira Grande	-	-	-	-	-	-	-
361	57	Fanjove Island	-	-	-	-	-	-	-	-
378	58	Ras Mkumbi (Moresby Point).	-	-	-	-	-	-	-	-
385	59	Ras Kanzi	-	-	-	-	-	-	-	-
429	114	Chumbe island	West side	6 17	39 11	-	-	-	-	-
433	115	Zanzibar	Landing place southward of Ras Shangani.	6 10	39 11	2	Red.	F.	-	-
	115A		Landing place northward of Shangani.	-	-	2	Green.	F.	-	-
444	118	Ras Nungwe or Hog Point.	-	-	-	-	White.	F.	-	-
444	117	Mwana Mwana	-	-	-	-	White.	-	-	-
444	116	Mungopani	-	-	-	-	-	-	-	-
465	119	Ras Kegomacha	-	4 52	39 41	-	-	-	-	-
491	62	Mombasa	Ras Serani	4 4	39 41	1	White.	F.	-	12
590	90	Mamutzu	-	-	-	-	-	-	-	-

No. in Light List.	General Description of Building or Vessel.	Height in Feet above High Water.	Approximate Height in Feet of Building.	Year established or altered.	Character of Apparatus, or Order, and Power in Units of 1,000 Candles, when known.	Remarks.
36	- - -	138	39	- -	- - -	In very clear weather it may possibly be seen from eastward of Cockburn shoal.
37	Iron tower, white at base, small house, with red roof, at base.	95	33	- -	- - -	Visible from S. 80' E. to N. 88° E. (12°).
41	- - -	- -	- -	- -	- - -	*Intended.*
42	- - -	- -	- -	- -	- - -	*Discontinued.*
45	- - -	85				
47	- - -	33	- -	- -	- - -	Reported to be visible only five miles.
—	- - -	42	28			
52	Tower on south corner of Government buildings.					
57	- - -	65				
58	- - -	- -	- -	- -	- - -	*Unreliable.*
9	- - -	- -	- -	- -	- - -	Visible from N. 48° E., through south, to N. 46° E.
114	- - -	- -	- -	- -	- - -	*Constructing.*
115	- - -	- -	- -	- -	- - -	Two *red* lights, placed horizontally, are shown from the mainmast of the wreck *Glasgow.*
115A	- - -	- -				
118	- - -	55	45	- -	- - -	
117	- - -	75				
116	- - -	116	76	- -	- - -	
119	- - -	- -	- -	- -	- - -	*Constructing.*
62	- - -	65	- -	- -	- - -	*Intended.*
90	- - -	- -	- -	- -	- - -	*Destroyed by a cyclone,* 1898.

APPENDIX.

TABLES

FOR FINDING APPROXIMATELY THE

TIME AND HEIGHT OF

HIGH WATER

AT

PORT NATAL,

BY

CAPTAIN W. N. GOALEN, R.N.

METEOROLOGICAL TABLES.

SIMONS BAY.

PORT NATAL.

EXAMPLE of the mode of constructing TIDE TABLE from the following TABLES.

PORT NATAL, May 1897.

Local astronomical time of high water.

Moon's Transit.	Lunitidal interval. Table I.	Moon's Declination for date.	Correction. Table II.	Time of high water.	Moon's Parallax at H. W.	Higher or Lower Tide.	Semi-menstrual Inequality. Table IV.	Correction for higher high water. Table V.	Diurnal Inequality. Table VI.	Height of high water. D.+E. or D+E. − F.
A.	B.	A.+B.	C.	A.+B.±C.			D.	E.	F.	
D. H. M.	H. M.	°	M.	D. H. M.	′		Ft. Ins.	Ft. Ins.	Ft Ins.	Ft. Ins.
23 6 20 I.	3 4	6 S.	25 +	23 9 49	56	H.	4 2	0 1 +	—	4 3
23 18 41 S.	3 25	3 S.	30 +	23 22 36	55¼	L.	—	—	0 5	3 10
24 7 2 I.	3 47	0	35 +	24 11 24	55	H.	4 1	0 1 +	—	4 2
24 19 23 S.	4 9	3 N.	25 +	24 23 57	55	L.	—	—	0 5	3 10
25 7 43 I.	4 30	6 N.	15 +	25 12 28	54¼	H.	4 4	0 0	—	4 4
25 20 3 S.	4 49	8 N.	8 +	26 1 0	54½	L.	—	—	0 5	4 0
26 8 24 I.	4 53	11 N.	5 +	26 13 22	54	H.	4 7	0 1 −	—	4 6
26 20 44 S.	4 56	14 N.	4 +	27 1 44	54	L.	—	—	0 4	4 3
27 9 5 I.	5 1	16 N.	7 +	27 14 13	54	H.	5 0	0 3 −	—	4 9
27 21 27 S.	4 55	18 N.	8 +	28 2 30	54	L.	—	—	0 3	4 6

EXPLANATION OF ABOVE TIDE TABLE.

In column A, S. signifies superior, and I. inferior transit of the moon.

In adding A., B., and C, regard must be had to the algebraic sign of C.

Refer to table III. to ascertain whether a tide is higher or lower, and place H. or L. in column higher or lower tide accordingly.

The semi-menstrual inequality, obtained from Table IV., is only entered in the column for tides for higher high water (H.).

In the last column the height of the higher high water (H.) is found by adding D. and E., and in the case of the lower high water (L.) by subtracting the quantities in column F. from the mean of the heights of higher high water, preceding and following.

In using the tables, it is of course necessary to interpolate. With Tables II., V., and VI., when the maximum declination is less than 28° or the maximum parallax less than 61′, then the correction to be taken from those tables for the maximum declination or parallax is the mean of the amounts against the increasing and decreasing figures of such declination or parallax. Thus:—With table II., if the maximum declination were 21° N., with Moon's transit 5h., the time correction for maximum declination would be the mean of 45m. — and 15m. — = 30m—.

TIDE TABLES.—PORT NATAL.

From abstract diagram of one year's (1897) observations of the self-registering gauge, Port Natal.

Time is local astronomical time, and the heights are given above the level of the zero of the gauge, which is equivalent to the level of mean low-water springs (lower tide).

There are two nearly equal tides in the lunar day at Port Natal, the diurnal inequality of time seldom exceeding half-an-hour, and that of height usually less than 6 inches.

TABLE I.—Lunitidal Intervals.

Moon's Transit (hours).											
0 or 12	1 or 13	2 or 14	3 or 15	4 or 16	5 or 17	6 or 18	7 or 19	8 or 20	9 or 21	10 or 22	11 or 23
Corresponding Lunitidal Interval (hours and minutes).											
4 15	3 52	3 30	3 7	2 46	2 30	2 44	3 45	4 48	5 0	4 50	4 35

TABLE II.—Time Correction for Moon's Declination (in minutes).

a. Tide following Moon's Superior Transit.

Moon's Transit. — Hours.	North.						Moon's Declination.									South.
	(Going north.)			>	<		(Going south.)					>	<	(Going north.)		
	0.	7°.	14°.	21°.	28°.	21°.	14°.	7°.	0.	7°.	14°.	21°.	28°.	21°.	14°.	7°.
0 or 12	0	3 +	5 +	0	5 +	15 +	10 +	7 +	3 +	0	10 −	15 −	18 −	15 −	10 −	5 −
1 or 13	8 −	2 −	0	2 −	2 −	7 +	13 +	12 +	10 +	3 +	5 −	15 −	18 −	10 −	2 −	5 −
2 or 14	12 −	6 −	3 −	4 −	5 −	2 +	12 +	20 +	18 +	8 +	0	10 −	18 −	10 −	2 +	0
3 or 15	2 +	7 −	12 −	18 −	15 −	0	15 +	25 +	30 +	20 +	5 +	8 −	18 −	10 −	5 +	7 +
4 or 16	10 +	7 −	20 −	30 −	32 −	10 −	15 +	30 +	37 +	30 +	18 +	5 −	20 −	5 −	15 +	15 +
5 or 17	18 +	2 +	15 −	35 −	45 −	15 −	18 +	35 +	45 +	40 +	25 +	0	15 −	5 +	20 +	25 +
6 or 18	28 +	10 +	15 −	45 −	60 −	5 −	30 +	45 +	55 +	40 +	15 +	15 −	35 −	10 −	10 +	22 +
7 or 19	35 +	20 +	5 −	35 −	30 −	15 +	35 +	40 +	38 +	20 +	0	25 −	45 −	5 −	15 +	30 +
8 or 20	20 +	10 +	0	15 −	5 +	28 +	30 +	25 +	15 +	5 −	20 −	22 −	20 −	0	10 +	15 +
9 or 21	0	0	5 +	12 +	22 +	22 +	18 +	10 +	0	10 −	22 −	22 −	15 −	5 −	5 +	10 +
10 or 22	2 +	0	3 +	10 +	20 +	15 +	5 +	5 +	5 +	0	10 −	20 −	18 −	10 −	0	5 +
11 or 23	5 +	2 +	0	5 +	15 +	10 +	0	2 +	5 +	5 +	5 −	10 −	18 −	10 −	2 −	0

TABLE II.—TIME CORRECTION FOR MOON'S DECLINATION, &c.—*continued.*

b. Tide following Moon's Inferior Transit.

Moon's Transit.	NORTH.							MOON'S DECLINATION.								SOUTH.
	(Going north.)			>		<		(Going south.)				>		<		(Going north.)
Hours.	0.	7°.	14°.	21°.	28°.	21°.	14°.	7°.	0°.	7°.	14°.	21°.	28°.	21°.	14°.	7°.
0 or 12 -	10 +	5 +	0	5 −	10 −	0	0	10 −	5 −	2 +	0	7 −	5 −	5 +	5 −	5 +
1 or 13 -	5 +	2 +	2 −	5 −	15 −	2 −	5 +	5 +	8 −	3 −	2 −	7 −	5 −	5 +	5 +	2 −
2 or 14 -	0	0	5 −	5 −	20 −	5 −	10 +	12 +	8 +	5 −	5 −	3 −	5 −	5 +	15 +	10 +
3 or 15 -	15 +	5 +	7 −	15 −	25 −	10 −	10 +	25 +	20 +	10 +	8 −	8 −	10 −	10 +	20 +	20 +
4 or 16 -	30 +	15 +	5 −	30 −	30 −	10 −	12 +	33 +	30 +	20 +	8 +	10 −	15 −	10 +	30 +	25 +
5 or 17 -	35 +	25 +	0	45 −	45 −	15 −	15 +	45 +	40 +	25 +	15 +	3 −	20 −	10 +	30 +	35 +
6 or 18 -	45 +	25 +	5 +	20 −	60 −	0	10 +	55 +	50 +	20 +	10 +	5 −	30 −	5 +	25 +	45 +
7 or 19 -	50 +	30 +	10 +	0	20 −	20 +	20 +	30 +	50 +	15 +	0	15 −	40 −	5 +	20 +	35 +
8 or 20 -	30 +	15 +	5 +	0	15 +	25 +	22 +	25 +	25 +	5 +	10 −	18 −	22 −	5 +	15 +	25 +
9 or 21 -	10 +	0	2 −	5 −	10 +	10 +	15 +	22 +	10 +	2 −	12 −	18 −	5 −	2 +	8 +	12 +
10 or 22 -	10 +	2 +	0	5 −	0	5 −	5 +	18 +	0	2 −	8 −	12 −	5 −	0	5 +	10 +
11 or 23 -	12 +	5 +	0	5 −	0	0	5 −	2 +	3 +	2 +	3 −	5 −	5 −	0	2 +	8 +

TABLE III.

To find which is the higher tide. The higher high water follows the Moon's superior transit when the Moon's declination is from 25° N. (going south), through extreme south, to 25° S. (going north) : and follows the Moon's inferior transit when the declination is from 25° S. (going north), through extreme north, to 25° N. (going south).

TABLE IV.—SEMI-MENSTRUAL INEQUALITY OF HEIGHT

Higher tide.

MOON'S TRANSIT (hours).											
0 or 12	1 or 13	2 or 14	3 or 15	4 or 16	5 or 17	6 or 18	7 or 19	8 or 20	9 or 21	10 or 22	11 or 23
CORRESPONDING SEMI-MENSTRUAL INEQUALITY OF HEIGHT (feet and inches).											
6 0	6 0	5 10	5 7	5 2	4 9	4 3	4 1	4 5	4 11	5 6	5 10

TABLE V.—CORRECTION to HEIGHT for MOON'S PARALLAX and DECLINATION. (In inches and for higher tide only.)

Moon's Parallax.		(Increasing.)			MOON'S DECLINATION.				(Decreasing.)
		0.	7°.	14°.	21°.	28°.	21°.	14°.	7°.
Increasing	54′	2 –	3 –	4 –	5 –	6 –	7 –	5 –	3 –
	55′	1 –	2 –	3 –	4 –	5 –	6 –	4 –	2 –
	56′	0	1 –	2 –	3 –	4 –	4 –	3 –	1 –
	57′	2 +	1 +	0	2 –	3 –	3 –	1 –	1 +
	58′	4 +	4 +	2 +	0	2 –	2 –	0	2 +
	59′	5 +	6 +	5 +	2 +	0	0	2 +	4 +
	60′	6 +	7 +	6 +	4 +	1 +	1 +	3 +	5 +
	61′	7 +	7 +	7 +	5 +	2 +	2 +	4 +	6 +
Decreasing	61′	7 +	8 +	7 +	5 +	2 +	2 +	4 +	6 +
	60′	6 +	7 +	6 +	3 +	0	1 +	3 +	5 +
	59′	5 +	6 +	5 +	2 +	1 –	0	2 +	4 +
	58′	4 +	4 +	3 +	1 +	2 –	1 –	2 +	4 +
	57′	3 +	3 +	2 +	0	3 –	2 –	1 +	3 +
	56′	2 +	2 +	1 +	1 –	3 –	3 –	0	1 +
	55′	1 +	1 +	0	2 –	4 –	5 –	2 –	0
	54′	0	1 –	2 –	3 –	5 –	6 –	4 –	2 –

TABLE VI.—MEAN DIURNAL INEQUALITY of HEIGHT.

North.								Moon's Declination.						South.	
(Going north.)			>		<			(Going south.)			>	<		(Going north.)	
0°.	7°.	14°.	21°.	28°.	21°.	14°.	7°.	0.	7°.	14°.	21°.	28°.	21°.	14°.	7°.
								Mean Diurnal Inequality. (Inches.)							
5	5	4	3	1	1	2	4	5	6	7	6	2	2	4	5

PLACE.—SIMONS BAY, OBS. △ LAT. 31° 11′ 32″ S., LONG. 18° 25′ 52″ E.

METEOROLOGICAL TABLE COMPILED FROM 5 YEARS' OBSERVATIONS.

MONTH.	BAROMETER, reduced to 32° and Sea Level.		TEMPERATURE.				Relative Humidity.	Clouds, 0 to 10, Mean Amount.	RAIN.		WIND.										No. of Days Gales.	No. of Days Fogs.	REMARKS.
												Number of Observations from											
	Mean Height.	Extreme Range.	Mean.	Mean Daily Range.	Max.	Min.			Total Fall.	No. of Days.	Average force, Beaufort scale.	N.	N.E.	E.	S.E	S.	S.W.	W.	N.W.	Calm.			
	Ins.	Ins.	°	°	°	°			Ins.														
January											4·5	0·6	0·2	0·2	28·4	4·2	5·4	2·4	4·0	5·8			
February											5·0	1·2	0·4	0·2	20·6	3·0	5·0	3·4	4·2	6·8			
March											4·3	0·4	—	0·6	25·2	5·2	1·5	6·0	4·2	11·2			
April											4·0	1·2	—	0·8	16·0	2·2	0·7	2·6	7·2	16·0			
May											3·8	1·2	0·2	0·2	10·7	2·2	0·2	4·8	10·2	19·0			
June											3·9	0·5	0·2	0·8	7·5	1·0	1·2	6·0	19·8	10·8			
July											3·7	3·2	1·6	0·2	7·2	1·8	0·8	5·8	13·2	12·6			
August											4·0	4·0	1·8	0·8	10·6	2·6	2·6	4·4	13·4	9·4			
September											4·0	3·0	0·8	0·2	15·0	3·2	2·0	2·8	12·0	9·0			
October											4·0	0·8	0·2	0·6	20·4	3·4	1·6	3·4	14·4	4·6			
November											4·1	—	—	—	21·4	4·2	4·0	6·3	10·4	5·0			
December											4·5	0·6	—	0·6	23·4	4·2	4·2	3·8	7·0	1·4			
Means and Totals											4·15	16·7	5·4	5·2	206·4	37·2	29·2	52·2	120·0	111·6			

PLACE.—PORT NATAL, OBS. ▵ LAT. 29° 52′ 40″ S., LONG. 31° 3′ 10″ E.

METEOROLOGICAL TABLE COMPILED FROM 2 YEARS' OBSERVATIONS.

MONTH.	BAROMETER, reduced to 32° and Sea Level.		TEMPERATURE.				Relative Humidity.	Clouds, 0 to 10, Mean Amount.	RAIN.		WIND.										No. of Days Gales.	No. of Days Fogs.	REMARKS.
	Mean Height.	Extreme Range.	Mean.	Mean Daily Range.	Max.	Min.			Total Fall.	No. of Days.	Average Hourly Velocity.	Number of Observations from											
												N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.			
	Ins.	Ins.	°	°	°	°			Ins.														
January					95·7	59·3			4·3		23·0	—	51	15	4	3	44	—	—				Temperature and rainfall is the mean of 4 years' observations.
February					92·3	61·7			5·3		25·7	—	44	8	5	10	30	—	—				
March					91·3	62·0			6·0		22·3	—	37	15	9	6	42	2	1				
April					87·7	55·7			3·9		22·6	—	44	13	4	7	47	2	—				
May					86·3	51·3			1·4		20·5	2	56	4	4	1	34	1	—				
June					83·5	47·7			1·1		17·3	2	31	7	3	4	56	3	—				
July					89·3	47·0			0·4		17·6	1	39	11	9	10	43	—	—				
August					91·7	49·7			1·2		23·2	—	54	8	1	2	49	2	—				
September					95·3	48·5			3·0		23·6	—	37	11	—	9	53	2	—				
October					94·3	54·0			4·7		22·7	—	43	14	5	2	50	3	—				
November					91·5	55·3			3·7		22·4	—	25	15	8	7	58	—	—				
December					93·7	60·0			7·0		23·1	2	22	18	8	10	50	1	—				
Means and Totals					91·1	54·3					22·0	7	483	139	60	71	556	16	1				

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